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amples of reversion to remote ancestral characters rather than as results of recent hybridization."—J. M. C.

Comparative leaf anatomy of Agave.—In a genus consisting of species so incompletely characterized and so hard to differentiate as those of the succulents usually are, every applicable character is valuable and its application is a real service to science. Little beyond the most general and scattered facts have heretofore been recorded for the histology of Agave, and a recently published study of its leaf anatomy, by MÜLLER,[13] therefore, stands alone on the shelves. The difficulty of such a study and the value of its outcome are as largely influenced by the accuracy of naming and the representative character of the material on which it is based as on fulness of representation. In the present case the large collections of Palermo and La Mortola, where many of the species are planted out in the open, furnished material which is as likely to have been normal and accurately named as could be hoped for in the genus Agave, and its examination seems to have been carefully and systematically made. The details of structure, which are rather fully illustrated by means of drawings and low-power photographs, are followed by an analytical key occupying five quarto pages, and yet it is doubtful whether tenable names are likely to be found for many plants by its aid.—W. TRELEASE.

Death by low temperature.—Using the molds, Aspergillus, Penicillium, and Botrytis, BARTETZKO has made a new investigation under the guidance of PFEFFER, on death by cold.[14] He finds these fungi able to bear temperatures in a sub-cooled solution (without actual freezing) which would be fatal in the same time were the solution allowed to freeze. But even in the sub-cooled solution death ensues on longer exposure. With increase in the osmotic pressure of the plant sap there is a lowering of the death point, but there is no simple relation between the two. Isotonic solutions of different sorts have nearly the same effect on the resistance of the plant to cold. Only with *Aspergillus niger* did the use of a potassium nitrate solution reduce the resistance notably. In contrast to the conclusion of MOLISCH, BARTETZKO thinks death by cold cannot be due merely to withdrawal of water, because in certain cases this will be borne, while in others death takes place above the temperature at which any considerable loss of water occurs.—C. R. B.

Root excretions.—Inasmuch as the minuteness of the quantity of root excretions has again and again prevented the determination of the kind of acid, other than H_2CO_3, whose presence the corrosion experiments have led observers to suspect, ABERSON, in reinvestigating the question,[15] sought only to determine the concentration of the H ions to which the solvent action must be due. By using the delicate electrometric method of NERNST he has found that the concentration of the H ions corresponds to that in water (8.5 to 0.5×10^{-8} in root excretions at 16–20°, as against 7.7×10^{-8} in water at 18°). He then proceeds to show that the H ions present in such a concentrated solution of H_2CO_3 as is found in the mucus investing the root hair are from 200 to 4000 times as numerous as in the other excretions, and that the results of other observers, who used indicators, are consonant with the quantities of H ions found. The carbonic acid is quite sufficient to account for all the solvent action of the roots.—C. R. B.

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[13] MÜLLER, CARL, Beiträge zur vergleichenden Anatomie der Blätter der Gattung Agave und ihrer Verwertung für die Untersoheidung der Arten. Bot. Zeit. **67**^{1}:93–139. *pls. 4, 5. figs. 22.* 1909.

[14] BARTETZKO, HUGO, Untersuchungen über das Erfrieren von Schimmelpilzen. Jahrb. Wiss. Bot. **47**:57–98. 1909.

Sensitizing protoplasm.—A considerable number of organisms are killed by the action of light, especially by the violet and ultra-violet rays. Among them are the small crustaceans of the genus Daphnia. Acting upon a suggestion of DREYER, HANSSEN[16] has conducted experiments to determine whether it is possible to sensitize the organism by appropriate dyes so that death would be hastened. Selecting substances that apparently do not harm the daphnias in darkness, he found that erythrosin, methylene blue, eosin, Bengal rose, and neutral red were particularly effective. He ascribes the effect to a process analogous to the sensitizing of a photographic plate to additional wave lengths, so that the added energy absorbed produces the desired effect more quickly than without the sensitizer. The paper adds strength to the theory that chlorophyll acts as an optical sensitizer in photosynthesis.—C. R. B.

Vascular anatomy of ferns.—PELOURDE[17] proposes to classify the vascular structures of the petioles of recent and fossil ferns by arranging them in four groups: (1) with a pair of vascular bundles, each having the form of a "hippocampus," which may nearly or quite meet on the lower (abaxial) side, forming a horseshoe; (2) with several bundles arranged as in the first class, each of the two adaxial bundles showing a crook which corresponds to the head of the hippocampus; (3) with a single arc-shaped strand, open above; (4) similar to the last but open below and closed above. No mention is made of the extensive memoir of BERTRAND and CORNAILLE,[18] who consider that type (3), found in Osmunda, represents the primitive condition from which all the others may be derived.—M. A. CHRYSLER.

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[15] ABERSON, J. H., Ein Beitrag zur Kenntnis der Wurzelausscheidungen. Jahrb. Wiss. Bot. **47**:41–56. 1909.

[16] HANSSEN, OLAV, Recherches experimentales sur la sensibilisation optique du protoplasma. Overs. Kgl. Danske Vidensk. Selsk. Forh. **1908**:113–132. *pls. 4.*

[17] PELOURDE, F., Recherches comparatives sur la structure des fougères fossiles et vivantes. Ann. Sci. Nat. Bot. IX. **10**:115–147. *figs. 32.* 1909.

[18] BERTRAND, C. EG., ET CORNAILLE, F., La masse libéroligneuse élémentaire des filicinées actuelles et ses principaux modes d'agencement dans la fronde. Trav. et Mém. Univ. Lille **10**:1–221. 1902.